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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,895	09/16/2003	Gail A. Alverson	324758001US2	4522

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EXAMINER	
WILSER, MICHAEL P	
ART UNIT	PAPER NUMBER
2109	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/663,895	ALVERSON ET AL.	
	Examiner	Art Unit	
	Michael Wilser	2109	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *January 12, 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :1/12/04, 8/27/04, 10/7/04, 6/9/05, 7/13/06, & 3/2/07.

DETAILED ACTION

This action is in response to the original filing of September 16, 2003. Claims 1-17 are pending and have been considered below.

Information Disclosure Statement

1. The information disclosure statement filed January 12, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. The IDS claims that all foreign documents and non-patent literature are contained in the original filing of the parent application No. 09/192,205 filed on November 13, 1998. But, all of the documents listed on the IDS are not present in this application. The prior application only has 33 documents associated with it whereas the current applications IDS lists 50 documents. The missing documents need to be filed to be considered for examination.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 506 on page 18 paragraph 61 line 10, 1601 on page 26, paragraph 75 line

4, 1602 on page 26 paragraph 75 line 4, 1000 on page 26 paragraph 75 line 9, 1703 on page 30 paragraph 82 line 3, and 1702 on page 30, paragraph 82 line 4.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: 1004 in Figure 10, 1100 in Figure 16A, 1300 in Figure 16A, 1502 in Figure 17, and 1503 in Figure 17.

4. The drawings are objected to because each individual item within a figure is supposed to be labeled with a reference character. In Figure 16B there are no reference characters in the drawing. The main heading at the top of the drawing needs to be numbered and so do the other parts of the table if they are separate features from the main heading.

5. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1502 and 1503" has been used to designate both "add thread to blocked pool" and "invoke virtual processor code" in Figure 15 and "unwind stack frames" and "indirect lomgjmp" in Figure 17 respectively. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The disclosure is objected to because of the following informalities: the examiner notes the use of acronyms (e.g. slim, scur, and sres) throughout the specification without first including a description in plain text, as required. Even though these acronyms are later explained they have to have their meaning given the first time they are used.

8. On page 18 of the specification on line 29 the specification reads "In step 516, the routine clears the team swap header". Then two lines later in line 31 the specification repeats the exact same sentence word for word. Since step 516 comes

after step 515 and does not loop back around to step 514 the examiner is interpreting the first instance of this line as being a typo and incorrectly inserted. When comparing to Figure 5B the specification as interpreted as a series from 514 to 515 to 516 and therefore the first mention of 516 on line 29 should be removed from the specification.

9. On page 22 of the specification paragraph 69 line 17 the specification reads "amount greater that the slim value". The examiner is interpreting this as a typo and that the specification should have read "amount greater than the slim value".

10. On page 27 of the specification paragraph 76 the applicant references Figure 16B and discusses different features of the figure in detail. However, the applicant omits reference numbers to the figure that is being discussed. The applicant needs to add reference numbers to the specification so that one of ordinary skill in the art can read he specification and easily flip back and forth between the drawings and specification with minimal confusion.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-3, 5-9, and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borkenhagen et al. (US 6,567,839) in view of Sharangpani et al. (US 6,272,520).

Claims 1 and 7: Borkenhagen discloses a method and system for task scheduling (thread switching) (column 9, lines 55-67) comprising:

a. notifying a task that another has preempted (taken priority) from processor utilization (column 21, lines 7-15); and

b. deferring the swapping (switching) of the task until an event causes the task to become unblocked (column 12, lines 58-67 & column 13, lines 1-3).

However, Borkenhagen does not explicitly disclose that a notification is received from the task that it is ready to be swapped or receiving a notification that the task is blocked. However, Sharangpani discloses a similar method and system in which the task does send a notification that it is ready to be swapped (column 4, lines 63-67 & column 5, lines 1-5) and a notification is received informing whether the task is blocked (column 4, lines 31-37). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to receive a notification that the task is ready to be swapped and whether it is blocked in Borkenhagen. One would have been motivated to receive notification of readiness to be swapped and whether the task is blocked since in context swapping or switching critical information can be lost if a task that is blocked is removed from memory without checking first or if a task is removed prematurely from memory which can cause long memory latency and a decrease in throughput.

Claims 2 and 8: Borkenhagen and Sharangpani disclose a method and system as in Claims 1 and 7 above, and Borkenhagen further discloses that the computer system is a multi-threaded computer system (column 11, lines 21-23).

Claims 3 and 9: Borkenhagen and Sharangpani disclose a method and system as in Claims 1 and 7 above, and Borkenhagen further discloses wherein in response to a notification that the task saves its state (column 12, lines 22-25).

Claims 5 and 11: Borkenhagen and Sharangpani disclose a method and system as in Claims 1 and 7 above, and Sharangpani further discloses that the indication of a task being blocked includes identifying the blocked thread of the task (column 5, lines 60-67 & column 6, lines 1-3). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to identify the blocked thread of a task in Borkenhagen. One would have been motivated to identify the blocked thread so that this thread could be tracked and therefore the system could be notified as to when this particular thread becomes unblocked and would allow the system to immediately be able to swap or switch the task upon the unblocking and thereby improving latency and throughput.

Claims 6 and 12: Borkenhagen and Sharangpani disclose a method and system as in Claims 1 and 7 above, and Sharangpani further discloses tracking a number of threads

of the task that are blocked (column 4, lines 58-62). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to track a number of blocked threads of a task in Borkenhagen. One would have been motivated to track a number of blocked threads of a task so that once all of the threads of that task become unblocked the task van be swapped or switched out of memory.

13. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borkenhagen et al. (US 6,567,839) and Sharangpani et al. (US 6,272,520) as applied to claims 1-3, 5-9, and 11-12 above, and further in view of Hogle et al. (US 6,560,626).

Claims 4 and 10: Borkenhagen and Sharangpani disclose a method and system as in Claims 1 and 7 above, but do not explicitly disclose that the event is an indication from the operating system. However, Hogle discloses a similar method and system for task swapping (thread interruption) where the unblocking event is an indication from the operating system (column 5, lines 33-39 & column 6, lines 15-21). Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to have the unblocking event be a notification from the operating system in Borkenhagen and Sharangpani. One would have been motivated to have the event be a notification from the operating system since it has a working knowledge of all the threads and tasks currently running and therefore would be in the most appropriate spot to determine whether the task is ready to be unblocked.

14. Claims 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borkenhagen et al. (US 6,567,839) in view of Sharangpani et al. (US 6,272,520) and Hogle et al. (US 6,560,626).

Claim 13: Borkenhagen discloses a method for task scheduling (thread switching) (column 9, lines 55-67) comprising:

a. determining whether the task is blocked (column 12, lines 47-56).

However, Borkenhagen does not explicitly disclose that an indication is sent to the operating system that the task is ready to be swapped and that the thread is blocked. However, Sharangpani discloses a similar method in which an indication is sent to the operating system that the task is ready to be swapped (column 4, lines 63-67 & column 5, lines 1-5). Therefore it would have been obvious to one having ordinary skill in the art at the time of invention to notify the operating system that a task is ready to be swapped in Borkenhagen. One would have been motivated to notify the operating system so that the system can swap out the task that is ready to be removed and insert a new task that is ready for execution.

However, Sharangpani does not explicitly disclose of notifying the operating system that a thread is blocked. However, Hogle discloses a similar method in which the operating system is notified of a blocked thread (column 6, lines 46-60). Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the operating system notified of a blocked thread in Borkenhagen. One would have been motivated to notify the operating system of a blocked thread so that the

system would leave this thread in memory until it becomes unblocked to avoid additional memory latency and decrease in throughput.

Claim 14: Borkenhagen, Sharangpani, and Hogle disclose a method as in Claim 13 above, and Sharangpani further discloses that the determining is done by the task (column 6, lines 12-18. Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to have the task in Borkenhagen do the determining. One would have been motivated to have the task do the determining to decrease the latency and throughput lose of having other components within the system determining if the task or thread was being blocked or was ready to be swapped or switched from memory.

Claim 15: Borkenhagen, Sharangpani, and Hogle disclose a method as in Claim 13 above, and Borkenhagen further discloses of incrementing a variable relating to the number of blocked threads (column 18, lines 15-33).

Claim 16: Borkenhagen, Sharangpani, and Hogle disclose a method as in Claim 13 above, and Borkenhagen further discloses that the operating system receives an indication that the thread is no longer blocked (column 20, lines 57-67).

Claim 17: Borkenhagen, Sharangpani, and Hogle disclose a method as in Claim 16 above, and Borkenhagen further discloses of decrementing a variable relating to a number of blocked threads (column 18, lines 15-33).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Wilser whose telephone number is (571) 270-1689. The examiner can normally be reached on Mon-Fri 7:30-5:00 EST (Alt Fridays Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Myhre can be reached on (571) 270-1065. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MPW
March 13, 2007

James Myhre
Supervisory Patent Examiner